

REMARKS

Claims 1-4, 11-15, 17, 18, and 20 were pending, of which claims 17, 18, and 20 were withdrawn. The applicants present claims 1-4 and 11-15 for examination in view of the following remarks.

Claims 1-7 and 11-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over GB 2297137 ("Jarvenkyla '137") and GB 2297138 ("Jarvenkyla '138") in view of U.S. Pat. No. 4,606,953 ("Suzuki") and U.S. Pat. No. 5,997,968 ("Dries").¹

The applicant respectfully submit that the claims as amended are patentable over the cited prior art, whether considered separately or in combination.

The claimed invention is directed to a plastics pipe with an inner core and an outer removable skin layer bonded thereto. As identified by the applicants, it is important that the outer skin layer adheres to the inner core tightly enough to prevent substantial undesired relative movement between the skin and the core during installation. It is also important to ensure that this adhesion is insufficient to prevent the outer skin layer being cleanly removed by peeling and further that this does not cause a substantial reduction in the impact strength of the inner core. The applicants have surprisingly found that they can form such a pipe with an inner core of polyethylene and a skin comprising an outer layer of propylene block co-polymer and inner layer of a propylene random co-polymer, where the strength of the adhesive bond between the outer protective layer and inner bonding layer of the skin is sufficiently larger, for example at least two times the strength, than the adhesive bond between the bonding layer and the inner core. There is nothing in any of the cited references that would lead a person of ordinary skill in the art to arrive at such a pipe.

Jarvenkyla '137 and Jarvenkyla '138 do not provide any teaching in relation to differential adhesion, so a person of ordinary skill in the art would therefore not recognize the importance of differential adhesion between the layers. Because there is no indication that this relationship is a result effective parameter, a person of ordinary skill in the art would have had no reason to

¹ The applicants note that claims 1-4 and 11-15 were previously pending and respond as if this rejection was intended to apply to claims 1-4 and 11-15.

optimize the relative adhesion of the outer protective layer to the inner bonding layer to be at least twice that of the adhesion of the adhesive bond between the bonding layer and the inner core.

This is supported by a detailed analysis of Jarvenkyla '137 and Jarvenkyla '138. For example, the Jarvenkyla citations mention that, while not preferred, an adhesive with appropriate adhesion characteristics may be used.² Such an adhesive could be considered to represent a bonding layer. The teaching provided is that the adhesive should have a high cohesive strength, so that it does not leave a residue when stripped from the pipe, or alternatively that if any residue is left on the inner core it will aid fusion. There is nothing here to suggest that the adhesive would inherently be more adherent to the skin layer than the core. The requirement for "high cohesive strength merely suggests that the adhesive would, most probably, bond more strongly to itself than to the core material, but provides no indication one way or the other as to relative bonding of the adhesive to the outer layer or inner core. The other teaching in relation to leaving a residue, if anything, teaches away from the present invention, since it would be unlikely that an adhesive that leaves a residue on the inner core would bond more strongly to the outer layer than it does to the core. For at least this reason, a person of ordinary skill in the art, starting from Jarvenkyla '137 and Jarvenkyla '138, would not arrive at the differential adhesion required by claim 1 of the present application, much less a pipe according to claim 1. Furthermore, as the examiner recognized, there is nothing in the Jarvenkyla citations relating to a skin layer with an outer layer of propylene block co-polymer and an inner layer of propylene random co-polymer.

Suzuki is cited for its teaching in relation to polypropylene materials. Suzuki is, however, directed to a steel pipe coated with polypropylene. A person of ordinary skill in the art would recognize that such a pipe is very different to the plastics pipes of the Jarvenkyla citations and would not seek to combine the citations, since teaching relating to coatings of steel pipes is not relevant to teaching relating to plastics pipes. For example, a person of ordinary skill in the art would understand that a polypropylene coating on a steel pipe is intended for permanent

² See, e.g., Jarvenkyla '137, page 13, lines 15-23 and Jarvenkyla '138, page 14, line 25 – page 15, line 5.

installation to prevent corrosion, with a high adhesive strength to the steel pipe core.³ This is very different to the pipes of the Jarvenkya citations, where the outer layer is intended to be removed prior to electrofusion welding.⁴ Thus a person of ordinary skill in the art would not combine Suzuki with either of the Jarvenkya citations.

Even if a person of ordinary skill in the art were to combine Suzuki with the Jawenkyla citations, a person of ordinary skill in the art would not arrive at the present invention. Firstly, Suzuki teaches away from having a removable outer layer. If anything, combining the teaching of Suzuki with Jarvenkyla would therefore prompt a person of ordinary skill in the art to provide a non-peelable outer layer. Thus there is nothing in Suzuki that would cause a person of ordinary skill in the art to arrive at the differential adhesion required by claim 1 of the present application.

Secondly, nothing in Suzuki would result in a person of ordinary skill in the art providing a plastics pipe with a skin comprising an outer layer of a propylene block co-polymer and a bonding layer of propylene random copolymer, and an inner core of polyethylene. Instead, Suzuki teaches an outer layer of polypropylene over an adhesive layer on a steel pipe.⁵ The adhesive layers taught by Suzuki are modified polyolefin adhesives comprising 60 to 95% by weight unsaturated carboxylic acid modified crystalline polypropylene and unmodified crystalline polypropylene and 5 to 40 % by weight polyolefin rubbers,⁶ with the examples using a maleic anhydride-modified polypropylene adhesive. These represent melt adhesives, which a person of ordinary skill in the art would understand are primarily used to bond plastics to metals. There is nothing in Suzuki or the Jarvenkyla citations to suggest that these adhesives would be of any use in bonding a propylene block copolymer skin to a polyethylene inner core, much less that the level of adhesion would be as recited by the applicant's pending claim 1. For at least these reasons, claim 1 and the remaining claims which are dependent upon claim 1 are patentable over Suzuki, considered either alone or in combination with either or both of the Jarvenkyla citations.

³ See, e.g., Suzuki, column 7, lines 32 to 37.

⁴ See, e.g., Jarvenkyla '137 abstract and Jarvenkyla '138 abstract.

⁵ See, e.g., Suzuki, column 2, line 63 - column 3, line 4; and Figure 1.

⁶ See, e.g., Suzuki, column 4, lines 19 to 26.

Dries is cited for its teaching in relation to peelable skin layers. Dries is, however, directed to an opaque, peelable film which is suitable for use as a lid film for food containers. This is entirely different technical fields and certainly not an adjacent field of endeavor to Suzuki or either of the Jarvenkya citations. Thus a person of ordinary skill in the art would have no reason to look to Dries for teachings regarding possible modifications to Suzuki or either of the Jarvenkya citations.

Moreover, Dries does not provide any indication that the claimed materials could be used to form a plastics pipe with “an inner core of polyethylene and a [peelable] skin layer comprising an outer layer of a propylene block co-polymer and an inner layer of a propylene random co-polymer.” Rather, Dries discloses a peelable film that includes a base layer, a flexible interlayer, and a peelable top layer. Dries specifies that “[t]he film peels between the outermost peelable top layer and the substrate [such as a food container]. It does not peel between the coextruded layers, whereby residues on the substrate are avoided.”⁷ Thus, Driers does not disclose that “polypropylene random copolymers can be used to achieve a peelable skin layer thereby teaching that random copolymers are in fact peelable adhesives, especially when used on cores of polyethylene” as asserted in the office action dated May 28, 2010. The applicants have been unable to find any indication in Dries of “an inner core of polyethylene and a [peelable] skin layer comprising an outer layer of a propylene block co-polymer and an inner layer of a propylene random co-polymer” and request that the features relied on by the examiner be indicated with specificity if this rejection is maintained.

As is clear from the preceding paragraphs, claim 1 is inventive over all of the citations. Nothing in any of the cited references, either alone or in combination, will encourage a person of ordinary skill in the art to arrive at the invention as presently recited in claim 1. In particular, there is nothing in any of those citations that would result in a person of ordinary skill in the art forming a pipe of the present invention. Claim 1 is thus patentable as are all of the remaining claims which are dependent upon claim 1.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

⁷ Driers, column 3, lines 65-67.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

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Respectfully submitted,

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